www.srh.noaa.gov/tulsa

Tulsa Tornado Tribune

"Where People Who Know The Weather Get Their Weather"

National Weather Service Tulsa, Oklahoma Spring, 2005

Springlike Severe Weather Strikes Area on January 12

A potent low pressure system moved across the area on the evening of Wednesday, January12th, tapping into an unusually moist and unstable airmass for mid-January. The result was a complex of severe thunderstorms that marched across eastern Oklahoma and northwest Arkansas in the afternoon and evening hours.

Hardest hit were Centerton and Bentonville in northwest Arkansas, as an intense line of storms moved through at around 6 pm that evening. More than two dozen homes sustained damage in the Tunridge community, three of which sustained major damage. One person was injured by flying debris. A number of trees were also snapped or uprooted in and around the Centerton and Bentonville areas.

A survey team from the National Weather Service office in Tulsa investigated this damage, and concluded that the wind damage was a result of a microburst that produced wind gusts on the order of 70 to 80 mph. The microburst most likely struck the ground just north of highway 102, southwest of the Tunridge subdivision, and then spread quickly into and through the Tunridge subdivision.

The home located on the southwestern corner of the subdivision sustained major damage as a large portion of the roof on the west facing side of the home was removed. Wind pressure on the opposite interior wall of the attic resulted in the east facing exterior wall being blown out from the inside. One person was injured in this home. Debris from this home impacted a number of nearby homes to the north and east. Two other homes in the subdivision also received major damage, mainly to their roofs.

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One of the homes that suffered significant structural damage in the Tunridge community on January 12.

Watch by County Tests Continue

The National Weather Service continues to test the operational concept of having increased interaction between the NWS Storm Prediction Center (SPC) in Norman and the local NWS field offices. The NWS field offices at Norman and Tulsa are two of several test sites for the nation.

Fifteen years ago the National Severe Storms Forecast Center would advise local NWS forecast offices that a watch was being issued. Today, SPC and NWS meteorologists hold conference calls and together work up the counties that will be included in a tornado or severe thunderstorm watch. Once agreed upon, the familiar watch product is issued, but it states very clearly now that the "box" described by the coordinates given is just an approximation.

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Editor's Note

We have successfully wrapped up another season of spotter training. Thanks to all who participated!

Craig A. Sullivan - Editor

Inside this issue:

Watch by County

(Continued from page 1)

This watch issued for Florida illustrates the point:

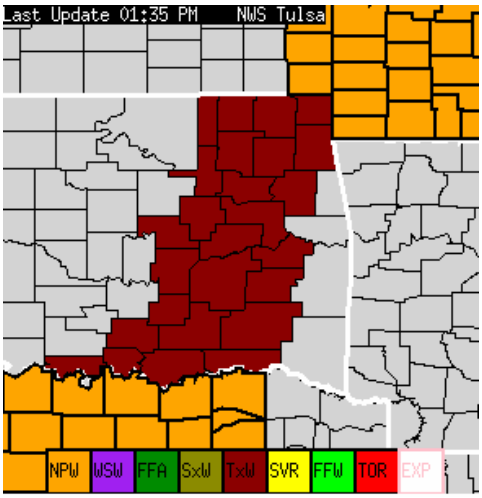
THE TORNADO WATCH AREA IS APPROXIMATELY ALONG AND 70 STATUTE MILES NORTH AND SOUTH OF A LINE FROM 15 MILES NORTHWEST OF APALACHICOLA FLORIDA TO 15 MILES EAST NORTHEAST OF JACKSONVILLE FLORIDA. FOR A COMPLETE DEPICTION OF THE WATCH SEE THE ASSOCIATED WATCH OUTLINE UPDATE (WOUS64 KWNS WOU1).

Once the watch is issued, local NWS offices will have more control over cancellation, and in rare circumstances, even extending the watch in time or space. The Tulsa office already exercised the extension option by adding counties to a tornado watch after the initial issuance.

We are formally testing software that creates a WCN, a Watch County Notification message. This product is experimental, but you can see nearly the exact same information in a Special Weather Statement issued along with the WCN. If the test works, the WCN message will become a live product and be used by all NWS Forecast Offices.

The final goal of all this is to blend the extensive expertise of the SPC with local expertise to issue more specific and more quickly updated tornado and severe thunderstorm watches. Nothing changes in regard to the warning program. All tornado, severe thunderstorm, and flash flood warnings for the NWS Tulsa service area are issued by NWS Tulsa staff.

Steve Piltz - Meteorologist in Charge



This is how the final tornado watch will appear on the NWS Tulsa webpage.

EXPERIMENTAL...WATCH COUNTY NOTIFICATION FOR WATCH 77
NATIONAL WEATHER SERVICE TULSA OK
537 PM CST THU MAR 24 2005

OKC001-021-023-035-037-041-061-077-079-091-097-101-105-107-111-113-115-117-121-127-131-135-143-145-147-250700-
/E.NEW.KTSA.SV.A.0077.050324T2337Z-050325T0700Z/

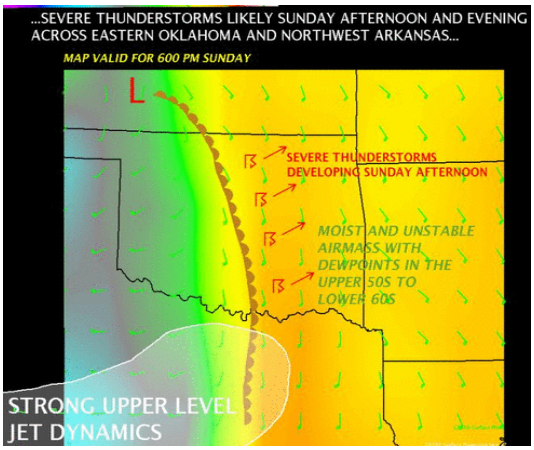
THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM WATCH 77 IN EFFECT UNTIL 1 AM CST FOR THE FOLLOWING AREAS

IN OKLAHOMA THIS WATCH INCLUDES 25 COUNTIES

IN EAST CENTRAL OKLAHOMA

CHEROKEE MUSKOGEE OKFUSKEE
SEQUOYAH...

The text version of the watch will be in the format shown above.



An example of the graphical Hazardous Weather Outlook image that will be displayed as part of the new Decision Support page. This graphic will normally depict the most significant threat expected during the next seven days.

Decision Support Page

www.srh.noaa.gov/tsa/cgi-bin/decisionmaker.php

A "Decision Support Page" has been added to the National Weather Service Tulsa website. The page provides an enhanced version of the Hazardous Weather Outlook (HWO), giving detailed information on the threat level of a particular weather hazard (tornadoes, fire danger, etc.).

On the left column (the colored "chiclets"), each potential hazard will be assigned a threat level: none (green), limited (yellow), elevated (red) or significant (purple). For each hazard, there will be a link to a graphic representing the area of greatest threat, similar to the HWO graphics currently in use. Additional graphics will continue to be added in the coming months. Threat levels will also be assigned for days two through seven.

The page will also contain audio of the latest HWO product and links to other text products, radar data and current watches and warnings in effect. Improvements will continue to be made, and your comments and suggestions are welcome, as always.

What to Report

When you observe any of the following weather events, please report it immediately to the National Weather Service in Tulsa.

1-800-722-2778

- Tornadoes
- Funnel Clouds
- Rotating Wall Clouds
- Hail - penny size (3/4") or larger
- Wind Gusts > 50 mph (estimated / measured)
- Flooding
- Any weather related damage
- Any life-threatening event

NOTE: Do NOT Report heavy rain or lightning

After the Storm

Safety does not stop once the storm has passed. Be aware of the dangers that exist after the storm.

- Be aware of possible gas leaks; DO NOT light matches or candles.
- Avoid downed power lines.
- Use caution walking near trees; weakened limbs may fall.
- Clean up or rope off danger areas, such as near broken glass.
- Carefully render aid to the injured when possible, until professional help arrives.
- Remain calm and alert, and listen for instructions from emergency officials.

Tornado Myths and Misconceptions

Few natural phenomena can be as sublimely beautiful, and at the same time as wickedly destructive as the tornado. Countless myths and legends have been attributed to tornadoes and their destructive power throughout recorded history. Some myths have proven to be just that, while many others live on. Following are some common myths and misconceptions...and perhaps some that are not.

Tornadoes can't cross rivers, etc.

Long before I considered meteorology as a career, my late grandmother loved to tell the story of how folks in her hometown of Columbus, Kentucky believed the town was protected from tornadoes by the Mississippi River. That is, until one came barreling across the river one spring afternoon, missing the town, but making believers out of the everyone in Columbus.

A tornado can cross anything it wants to. A number of towns *used to* have such myths before they were hit. In 1987, a violent F4 tornado crossed the Continental Divide near Yellowstone National Park.

Overpasses are safe

We have all seen the video of the people who rode out a tornado along the Kansas Turnpike several years ago. The truth is, stopping under a bridge to take shelter from a tornado is a very dangerous idea, for many reasons. The people in the video were lucky. While they were actually not inside the tornado vortex itself, flying debris could have caused serious injury or death. Three fatalities on May 3, 1999 were people stopped under overpasses.

Go to the southwest corner

This is likely based on the belief that, since tornadoes usually come from the southwest, debris will preferentially fall into the northeast side of the structure. But, tornadoes do not produce straight-line winds, even on the scale of a house, so the wind may come from any direction. The best course of action is to get as low as possible (a basement, preferably), and in and enclosed area (closet, etc.) with as many walls between you and the outside as possible.

Open windows to equalize pressure

Another fond memory from my youth was the "speech" read in a very authoritative voice when a tornado warning was broadcast on TV, which included this piece of advice: "*Open some windows and move away from them*." The truth is, you want to *avoid* windows altogether, and your time will be better spent seeking appropriate shelter. Besides, if the tornado hits your home, it will open the windows for you.

Tornadoes can drive straw into a tree

This is not really a myth. All kinds of strange things have been said to have happened in a tornado ("raining" fish, chickens stripped of feathers, etc.), many of them folklore, but just as many seen during damage surveys. How things like this occur are beyond the scope of this article (and far beyond my own level of comprehension), but it illustrates a very important point; tornadoes produce *tremendous* amounts of flying debris, and you *absolutely do not* want to be in the middle of it!

Some towns are tornado "magnets"

It sure seems that way, and it is possible that topographic effects can play a role in tornado *development* (e.g. the orientation of a particular river valley). But for the most part, some towns have just been luckier than others. There is no *conclusive* scientific evidence that some towns are tornado prone, though I suppose Fort Smith, Arkansas is more prone than, say, Fairbanks, Alaska. Of course, try telling all this to people in Moore, Oklahoma!

Mobile homes attract tornadoes

Again, it sure seems that way, considering most tornado deaths occur in them, and

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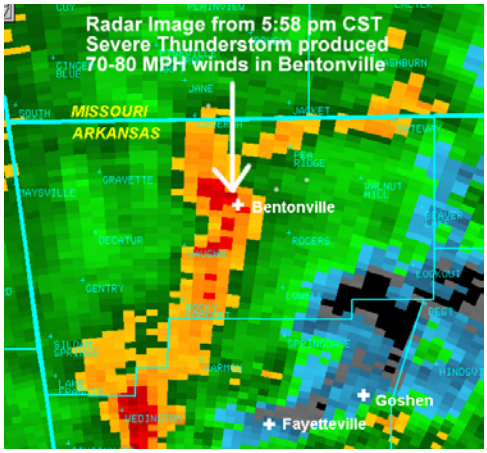
January 12

(Continued from page 1)

The wind continued to produce minor structural damage as it went through the remainder of the community, generally in a northeasterly direction. Privacy fences were blown down, several trees were snapped, windows were broken, shingles were removed from roofs, and exterior walls were impacted by flying debris.

The storms initially took on supercell characteristics as they developed over eastern Oklahoma during the afternoon. Many of the storms exhibited low level rotation, but no tornadoes were sighted. There were some reports of large hail, including golf ball size hail in Sawyer, OK (Choctaw Co.). Nickel size hail was reported both 5 miles northwest of Cookson, OK (Cherokee Co.) and 4 miles southwest of Watts, OK (Adair Co.).

Additional wind damage was reported across northwest Arkansas and far eastern Oklahoma during the early evening as the storms evolved into more of a squall line. Tree damage was reported 5 miles southwest of Warner, OK (McIntosh Co.), while wind gusts were measured at 70 mph near Sallisaw, OK a short time later. Near Goshen, AR (Washington Co.), the same line of storms that produced the wind damage near Bentonville blew a tree down across State Highway 45. Also, a tree was blown down over U.S. Highway 64 just east of Ozark, AR (Franklin Co.).



A small "bow echo" can be seen just west of Bentonville near the time of the significant wind damage. Bow echoes are often associated with damaging straight line winds. The storm west of Fayetteville produced damaging winds in Goshen about 40 minutes later.

Map of the Tunridge subdivision showing homes damaged on January 12.

In addition, the storms produced widespread heavy rain, with most areas east of U.S. Highway 69 receiving an inch or more. The heaviest rainfall was concentrated in Benton and Delaware counties near the headwaters of the Illinois River. Kansas, OK (Delaware Co.) received 2.99 inches and Gravette, AR (Benton Co.) received 2.45 inches. Some county roads in Benton, Carroll, Madison, and Franklin counties in Arkansas were impassable due to high water. Some county roads in northern Adair county were washed out. There was widespread street flooding in Tahlequah (Cherokee Co.).

A couple of days after the severe weather outbreak, a strong cold front plunged across the area. Overnight lows in the teens and daytime highs in the upper 20s and 30s followed suit, reminding us all that it was, in fact, still winter.

Myths

(Continued from page 3)

some of the most graphic reports of tornado damage come from mobile home communities. The truth is, mobile homes are, in general, much easier for a tornado to damage and destroy than well-built houses and office buildings. A brief, relatively weak tornado that may only do minor damage to sturdy houses can blow a mobile home apart.

Tornadoes don't strike downtowns of major cities

Actually, they do, even in places like Salt Lake City. Downtowns cover such tiny land areas relative to the entire nation, that the odds of a tornado hitting a major downtown are quite low; not for any meteorological reason, but because downtowns are small targets.

The bigger the tornado, the stronger

Not necessarily. There is *some* relationship between wide tornadoes having higher F-scale damage, but the size or shape of any *particular* tornado does not say anything conclusive about its strength. Some small "rope" tornadoes can still do violent damage, while some tornadoes over a quarter-mile wide have produced only weak damage.

Tornadoes follow Interstate 44

Okay…I made this one up...sort of. What mystical powers does I-44 have on the weather anyway? One logical explanation is to look at how I-44 is oriented; roughly WSW-ENE (about 240 degrees on a compass heading). This happens to be a very common direction for tornadic storms to travel. So, such a storm that develops near the highway in this case might roughly follow the highway ENE. But, alas, there seems to be no evidence that tornadoes are prone to *develop* near I-44.

Listed below are the ten deadliest tornadoes to strike within the NWS Tulsa County Warning Area, since 1880. The death tolls listed are for individual communities; some of these tornadoes caused additional fatalities in other locations.

Peggs, OK - 5/20/1920 - 71 dead
The town was almost completely destroyed (only seven buildings were left standing) and almost one-third of the town's population died. Only two other tornadoes in Oklahoma history have been more deadly.

Antlers, OK - 4/12/1945 - 69 dead
Approximately one-third of the town was destroyed. The storm was largely overshadowed in the press by the death of President Roosevelt.

Ft. Smith, AR - 1/11/1898 - 52 dead
This tornado touched down near the National Cemetery about 11 p.m., then moved through the heart of Ft. Smith. Three other deaths occurred in Van Buren.

Pryor, OK - 4/27/1942 - 49 dead
Nearly one-third of the town was destroyed. There were three other fatalities in rural locations southwest of Pryor.

Berryville, AR - 10/29/1942 - 29 dead
The tornado moved through around 10:30 p.m. and destroyed some 140 buildings. About 600 people were left homeless.

Green Forest, AR - 3/18/1927 - 24 dead
The tornado was up to a mile wide, and destroyed most of the southern half of town.

McAlester, OK - 5/8/1882 - 21 dead
Much of McAlester, at that time a small mining community of about 800 people, was destroyed.

Vireton, OK - 1/4/1917 - 16 dead
16 students perished as a Choctaw Indian Baptist Mission school was destroyed at the small settlement in Pittsburg County.

Greenwood, AR - 4/19/1968 - 14 dead
About 400 homes and 69 businesses were damaged or destroyed as the tornado hit the downtown area.

Wilburton, OK - 5/5/1960 - 13 dead
A family of tornadoes produced damage along a 50 mile path. Three other fatalities occurred in Keota.

Weather History: April 12, 1945

Sixty years ago this spring, a devastating outbreak of tornadoes occurred over eastern Oklahoma and western Arkansas, producing one of Oklahoma's most destructive tornadoes in terms of lives lost. Late in the afternoon of April 12, 1945, a large tornado devastated the city of Antlers. About 600 buildings in the town were destroyed, and over 700 were damaged. Sadly, sixty-nine people lost their lives in Antlers, and over 350 were injured. Total damage from this tornado alone (1945 dollars) was about 1.5 million dollars.

The Antlers tornado, the fourth deadliest in the state of Oklahoma's history, was largely overshadowed by the passing of President Roosevelt on the same day. In spite of the degree of the disaster, national and even local newspapers had more information on the President's death than on the tornado.

By all accounts, this was certainly a violent tornado, and has been listed as an F5 on the Fujita Scale. Keep in mind, however, that the Fujita Scale was not developed until the 1970's, so any ratings before that time are based on historical accounts rather than damage surveys.

The Antlers tornado was part of a significant outbreak that affected eastern Oklahoma and northwest Arkansas. A violent tornado moved over the eastern edge of Muskogee, OK, and hit the School for the Blind. There were 13 fatalities in Muskogee, three of them occurring at the school as the girl's dormitory roof collapsed. Many of the 200 injured were in the school gym. About 100 homes were damaged or destroyed, and losses (1945 dollars) totaled 1.4 million dollars.

Other deadly tornadoes occurred in the "Boggy" community in Latimer County, OK, where three children were killed as a small home was leveled. A strong tornado also moved from near Roland, OK to just north of Dora, AR. Five were killed in Oklahoma as a small home was destroyed. Two other fatalities occurred near Dora, AR. The town of Hulbert in Cherokee County, OK suffered heavy damage as 81 buildings were destroyed and four people were killed.

The storms did not stop there, as yet another strong tornado moved across Madison and Carroll counties in northwest Arkansas. Homes were destroyed in at least a half dozen small communities. One person died near Japton, and seven members of one family were killed as a small home was destroyed near Marble. Several thousand acres of forest were uprooted as well.

As a historical footnote to this story, at the time of this tornado outbreak, there literally was no such thing as tornado forecasting. In fact, the use of the word "tornado" in a forecast was strongly discouraged, and at times even forbidden, for fear that predicting tornadoes might cause panic. Tornado watches and warnings as we know them today were not issued.

The first documented, successful tornado forecast by meteorologists occurred three years later on March 25, 1948, by Air Force Capt. Robert Miller and Major Ernest Fawbush. After noticing similarities in the developing weather pattern to that which produced a tornado at Tinker AFB several days before, Fawbush and Miller advised their superior officer of a tornado threat in central Oklahoma that evening. The base carried out safety precautions, and despite the enormous odds against a repeat performance, the second tornado in five days directly hit the base.

Local News

Weatherpalooza '05

More than 80 teachers from the Tulsa area attended a day-long weather workshop conducted by WFO Tulsa. The event was coordinated by Science and Operations Officer Steve Amburn and was sponsored by the Tulsa World newspaper. Presentations during the workshop by Steve, Meteorologist Nicole Kempf and Warning Coordination Meteorologist Ed Calianese included topics such as El Niño, precipitation development, Doppler radar, weather observations, the water cycle, thunderstorms, lightning, and tornadoes. One of the goals was to expose teachers to a variety of information and resources to better incorporate weather in their lesson plans. Meteorologist Bruce Sherbon compiled and produced video clips that were provided to the teachers. The workshop was very well received and others like it will likely be held in the future.

Severe Weather Conference

Nearly 120 emergency managers, spotters, media members and the public attended a day-long severe weather conference conducted by WFO Tulsa, the Tulsa Area Emergency Management Agency, and the eastern Oklahoma and northwest Arkansas SKYWARN steering committee. Presentations included advanced spotter training by Ed Calianese, and an overview of new products and services from WFO Tulsa by Meteorologist Brad McGavock. A local amateur radio operator gave a presentation on APRS and how it can be better utilized during severe weather operations. A number of storm chasers also presented recent video highlights.

Spring Begins on Schedule

The official beginning of spring, according to the calendars, was March 20th. The spring 2005 severe weather season kicked off the very next day with three reports of brief tornado touchdowns in the vicinity of Okemah, and another 4 miles north of Enterprise in Haskell County. No damage was noted with these tornadoes. There were numerous reports of nickel to quarter size hail across eastern Oklahoma.

Employee Milestone

NWS Tulsa Electronic Systems Analyst and world-renowned chili cook Isaiah Daniels was recently honored for 25 years of federal service. Congratulations Isaiah, and thanks!

Let it Snow?

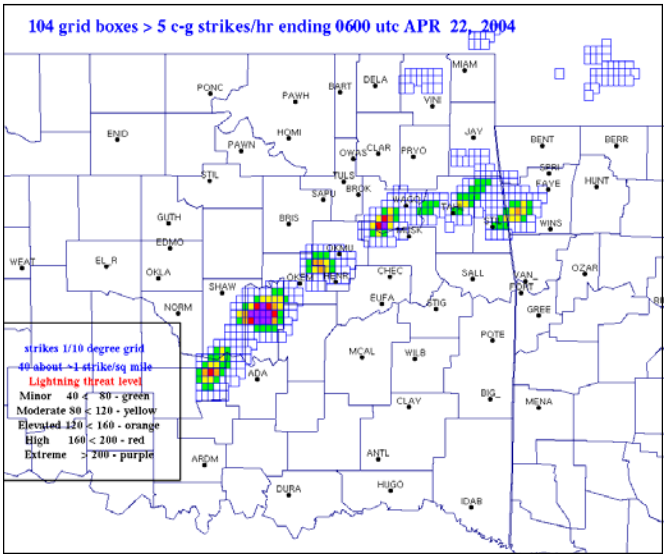
In the fall 2004 edition, we asked, "Does a mild wet summer mean a cold wet winter?" This winter certainly did not work out that way. Both Tulsa and Fort Smith placed in the top 15 mildest winters on record. Snowfall was scarce as both locations ranked in the bottom 15 for seasonal snow totals. I think we can safely assume the snow season is over, can't we?

Lightning Threat Analysis

Each year, about 25 million cloud-to-ground (CG) lightning flashes are recorded in the United States. Lightning remains the second leading cause of weather-related fatalities and results in an annual economic impact of around five billion dollars. And yet, up to now, very few NWS products have addressed the lightning threat in a particular location.

At NWS Tulsa, Meteorologists Nicole Kempf and Glenn Wiley have developed a five-tiered lightning threat analysis, using CG lightning density. The lightning threat is now being displayed on the NWS Tulsa website, and can be accessed via a link on the Decision Support Page. The analysis will also be used in text products to indicate where the greatest threat exists (although all lighting is deadly). Both the web and text products will be applicable to severe and non-severe thunderstorms.

The lightning threat level will be displayed for both the previous 15 minutes and previous hour for small (0.05° X 0.05° or about 10 square miles) grid boxes overlaid on a map of Tulsa's county warning area. Future improvements will be made, including the overlay of radar indicated storm motion to help users estimate the future lightning threat in their area.



One-hour lightning threat display from April 22, 2004.

10 Years on the Web

The first NWS Tulsa webpage was introduced in March, 1995, making us one of the first five NWS offices to have a web presence.